

FIG. 1A

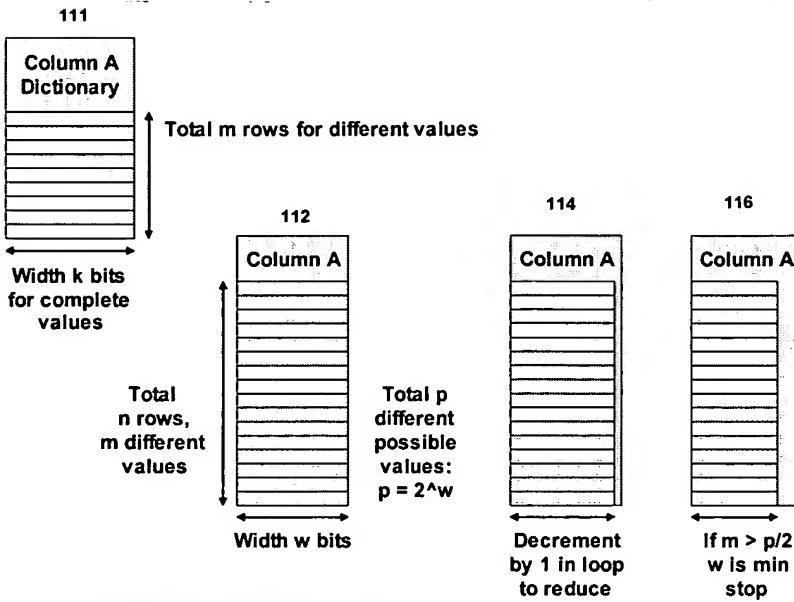


Figure 1B. Minimizing individual column width

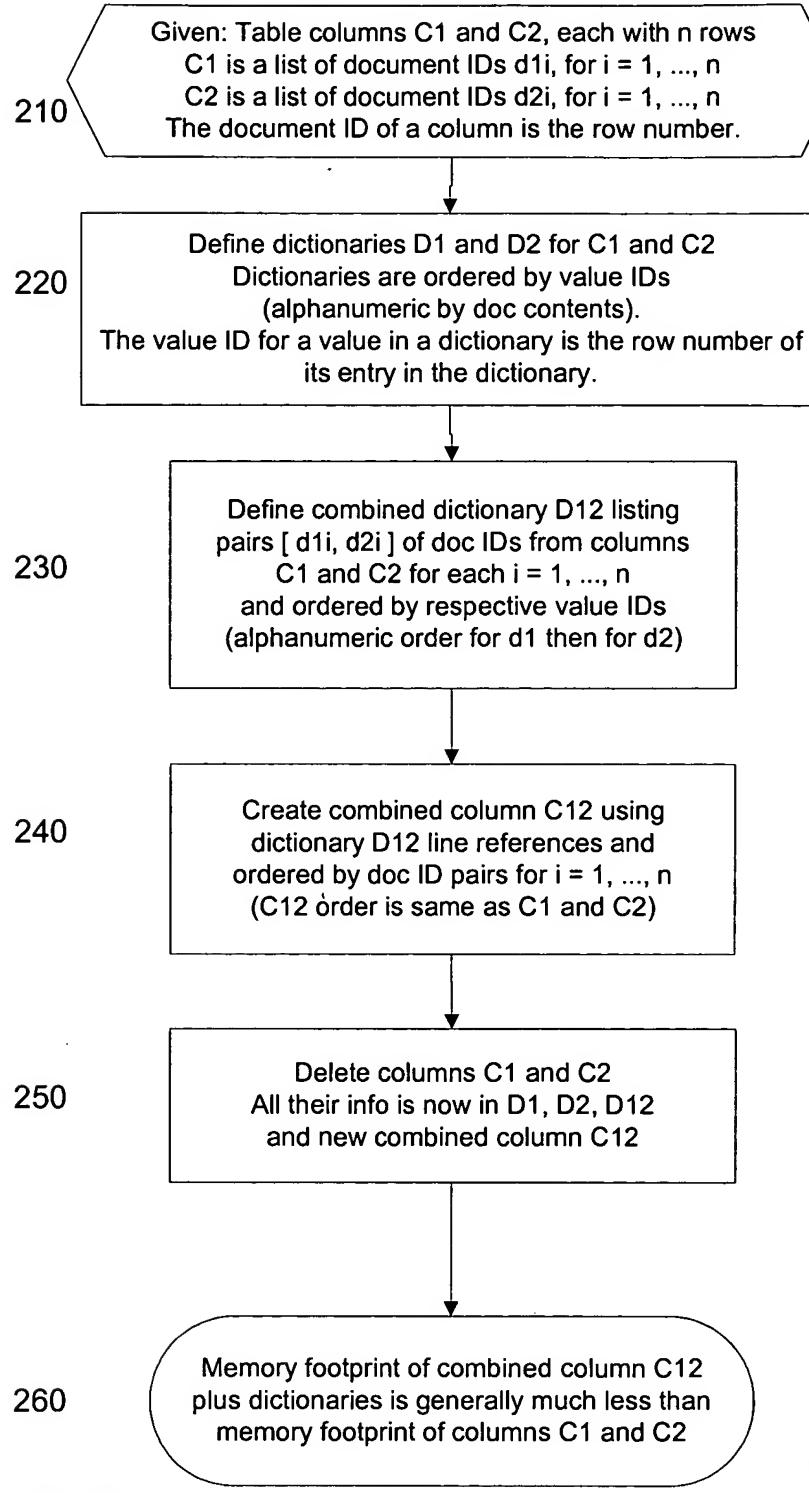


FIG. 2A

200

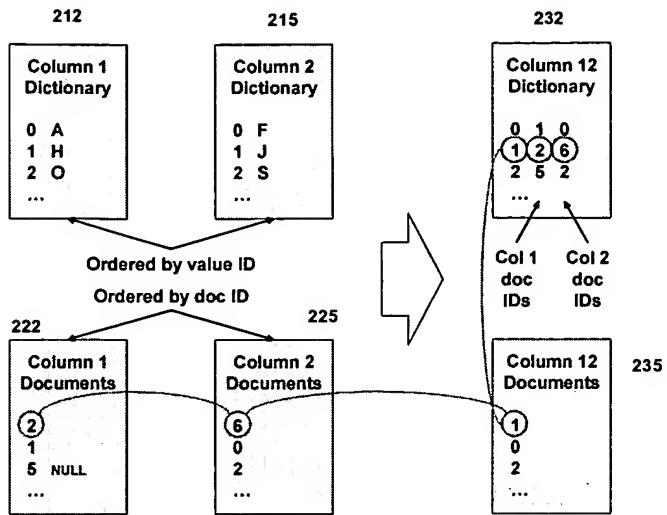


Figure 2B. Combining columns to save space

Memory required (bits)	Column	Dictionary
310	320	330
Original 1 335	$n * w1$	$m1 * k1$
Original 2 340	$n * w2$	$m2 * k2$
Combined 12 (worst case) 345	$n * (w1 + w2)$	$m1 * m2 * (w1 + w2)$
Combined 12 (best case) 350	$n * wm$	$mm * (w1 + w2)$

Key	
301	
n	Number of rows in original columns (and in original table)
wj	Width of column j in bits (minimized as in method 100, Fig. 1A)
mj	Cardinality of column j (i.e., number of different values in column j)
kj	Width of widest value in column j in bits (typically, $kj > wj$)
mm	Maximum of $m1$ and $m2$ (i.e., larger of the two values)
wm	Maximum of $w1$ and $w2$ (i.e., larger of the two values)

FIG. 3